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ABSTRACT

Once a school district decides to offer students virtual classes, it has to recognize the costs associated with the implementation, the logistical needs, the staff that will be needed to assist students, and the maintenance of the technoiogy. Adapting the philosophy of virtual education is only the beginning. The role of the traditional teacher and the classroom changes drastically in concert with the role of virtual learning and technology applications. One of the greatest challenges to implementing a virtual high school is training high school teachers who have experienced only traditional, face-to-face teaching, to become virtual educators. The new breed of schools use email, online chat rooms, Internet resources and archived resources to teach students. Virtual classes are offered to meet the needs of junior high, high school, college, and continual learning students. The instructional medium is particularly effective for four types of courses: advanced courses; innovative core academic courses that maximize the use of technology; courses for language minorities; and technical courses. Examples of the state and uses of virtual learning in schools and universities are given, with discussion including the technology, Internet connectivity, course credits, costs, special education, rural education, advantages, challenges and obstacles and future prospects. (Contains 27 references.) (AEF)

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Virtual Learning Is Becoming Reality

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Over the past several years, education has significantly changed due to technology, especially the Internet. Click. Click. Click. That's the sound of education in the 21st century. That's the sound of a mouse in the capable hand of a high school student (Lowenstein, 2001). Recently there has been much discussion regarding distance learning and virtual reality learning. Distance learning is typically defined as the delivery of live instruction from one site to another, or to multiple sites, using audio or video technologies that allow the teacher and students at different sites to interact with each other (Barker, 2000). Virtual implies "without place" and like traditional schools, virtual schools have curriculum, faculty, students, and much more (Van Horn, 1997). Virtual courses are accessible on-line via the Internet. Teaching in a virtual school means the classroom and school never closes. Florida High Schools support its beliefs that education in the future can be delivered at "any time, any place, any path, and any pace" (Johnston, 2000). In a virtual school, students can be young or old, be enrolled in public or private schools, or even home schooled. The types of courses range from general Math, English, Science and Social Studies, to advanced Calculus, Latin or Japanese languages. Students can log on from school, home, work, library, or even on vacation. Many courses that are offered are accredited and are accepted by high schools, colleges and universities. So why create a virtual school? An enormous amount of time, energy and money has been devoted to reforming K-12 schools in the United States in the last decade.

The trouble is that most plans are not working, and those that do work, work only for a short time. Although the first virtual reality products were developed more than 20 years ago, most people have seen virtual reality applications only through the lens of such unforgettable films as "The Lawnmower Man" and such science fiction television shows such as "Star Trek." Legitimate educational and training applications for this powerful technology have been in development for some time in the military, medicine, business, and education (Roblyer & Cass, 1999). One of the first virtual reality applications in education was created in 1992 by Dr. Veronica Pantelidis and Dr. Lawrence Auld, in response to a perceived need for a laboratory to study the implications of virtual reality for kindergarten through grade 12 education (Auld & Pantelidis, 1999). But the virtual high school movement has gained momentum since these programs began to appear, capturing the attention of educators, parents, students, and adding fuel to the engines of school reform across the United States (Roblyer & Elbaum, 1999/2000). Many educators recognize that we are still delivering education in the 21st century using a 19th century model. Collaborative virtual learning and telelearning allows educators to meet the learning needs of the digital generation by using advanced technology to create a deeper level of learner awareness through real-world experiences (Andrews & Marshall, 2000).

Once a school district decides to offer students virtual classes, it has to recognize the costs associated with the implementation, the logistical needs, the

staff that will be needed to assist students, and the maintenance of the technology. Adapting the philosophy of virtual education is only the beginning. The role of the traditional teacher and the classroom changes drastically in concert with the role of virtual learning and technology applications.

One of the greatest challenges to implementing a virtual high school is training high school teachers who have experienced only traditional, face-to-face teaching, to become virtual educators (Roblyer & Elbaum, 1999/2000). Unless you start with a great faculty, hand-picked by a very wise person over a number of years, you cannot build a great school (Van Horn, 1997). Faculty must be able to communicate and effectively work with colleagues. They must also be very comfortable with technology. In the virtual classroom, the teacher becomes a facilitator, as opposed to the old model of the teacher in front of the class (Pool, 1997). The main skills teachers need to bring to a virtual school are open-mindedness and flexibility, soft skills that are not typically part of the teacher education program. Teachers are flexible in creating new delivery approaches that transcend the traditional. Design elements become more critical as we consider how to make the lessons attractive. We should continually ask ourselves, "How am I inviting students into my classroom to learn?" (Johnston, 2000). Virtual instruction includes a broad range of activities that supplement traditional teaching. Computers will never replace the teacher in the classroom, however computers assist in engaging students in resources above and beyond the

traditional classroom. At the Babbage Net School (Lake Grove, NY), students meet in a "virtual classroom" twice a week with the instructor leading the class in a live, interactive session. The instructor asks questions of the students and vice versa, just like in a traditional class. A large classroom screen serves as the link between the students and the teacher (Tuttle, 1998). In Hudson Public Schools (Massachusetts), the virtual high school is built on simple concept. Each school in the consortium selects one or two innovative and technologically adept faculty members to teach over the Internet. These teachers receive training in how to teach net-courses, engage students, maximize the use of Internet-based resources, and utilize the best in multimedia technology. Each school provides each teacher with release time as well as a site coordinator who acts as a guidance counselor and technical advisor (Berman & Tinker, 1997). Teaching is important, time to plan and structure curriculum is the key!

In virtual schools, the classroom as we traditionally know it has changed. The new breed of schools use email, on-line chat rooms, Internet resources and archived resources to teach students. No classroom. No lectures. No surprise quizzes. No buses. No buildings (Tuttle, 1998). Since virtual learning is surrounded with technology, constant upgrading is needed as technology changes. This includes changing tools, hardware and the experimentation of new programs (Johnston & Mitchell, 2000). Most virtual education programs require heavy

capital investments in the initial phases. The technology start-up and maintenance costs can take $10,000 to $100,000 (Cagney, 1997).

Virtual classes are offered to meet the needs of junior high, high school, college and continual learning students. When choosing courses for enrollment, it is very important to check for accreditation by the institute offering the courses. Classes vary for many reasons, mainly to meet the needs of the students enrolled. Some courses are to supplement other educational programs such as remedial, some to enhance for gifted, others to suffice requirements for a diploma, certification or degree. The instructional medium is particularly effective for four types of courses:

1. Advanced courses, including advanced placement courses; advanced electives such as "Modeling and Calculus;" or advanced literature courses in any language.
2. Innovative core academic courses that maximize the use of technology, such as "Writing Through Hypertext," a simulations course on "Economics and the Budget Debate," or the "Global Lab" environmental studies course that uses on-line collaboration among students worldwide.
3. Courses for language minorities, so that small groups of students from a particular language background for whom individual schools are not

able to offer a bilingual program can take courses in their native language.

4. Technical courses built around the very technology we are using, such as "Network Operations" and "Robotics" (Berman, 1997).

The first class of the Illinois Virtual High School is underway. Nearly 100 students and over 80 districts have signed up for the pilot semester offerings. Courses are available to students in public, non-public and homeschoolers. Courses being offered are Calculus, Chemistry, English Language and Composition, English Literature and Composition, Microeconomics, Macroeconomics, Physics, Statistics, U.S. Government and Politics and U.S. History (Illinois State Board of Education, 2001). Many other states offer virtual courses like Illinois. Many of these states have formed consortiums within the state educational boards, while other states run independent programs. On-line High Choice 2000, a public charter school in Riverside, California, presents itself as the first totally on-line public high school in the United States. The school offers a fully certified 7th through 12th grade curriculum, plus adult education programs, on-line via the web. The programs are accredited by the Western Association of Schools and Colleges (Barker, 2000). Virtual courses are not limited to course credit; some courses are geared toward certifications. In Durham, North Carolina, students are taught C++ programming

language to write other programs. Several students are enrolled in Computer Technology I and will be given the opportunity to take the Microsoft Windows certification test upon completion of the course work (Hammonds, 1998). One course that provides more than just a course credit, an actual virtual reality experience, is the Original Virtual Enterprise Advertising. This is a student-run, "simulated" advertising agency. Six New York City Schools have joined the program, creating a simulated travel agency, office supplies enterprise, investment company, manufacturing enterprise, consulting firm, and a book and video club (Blanc, 1998). This is an example of how technology can bring people together to network, educate, and have fun. The distance-learning craze has spawned cyber-only schools like Jones International University, whose Colorado-based operation offers on-line courses to 500 students in 30 countries (Morse, 2000). Traditional campuses are also getting wired. On-line Learning.Net, a private Los Angeles-based company loosely affiliated with the University of California at Los Angeles, offers approximately 150 courses. Courses range from Accounting for non-accountants to Writing the Situation Comedy (Confessore, 1999). Colorado State University's MBA combines videotaped lectures and Internet discussion groups. "They use the same faculty and curriculum as

the on-campus program so they get the equivalent of a nationally recognized program" (Schulhof, 1999).

All Americans are entitled to a free education. If you believe this statement, you haven't been to school lately. All schools, all courses cost money. When choosing to enhance, supplement or substitute a traditional education for the virtual experience, it is very important to research the costs. Money is not the only consideration when deciding to go virtual. If the intended course credit is to be used toward a diploma or degree, it is important to find out before and not after if the credit will be accepted to the appropriate educational institute. While some schools offer dual credit for high school and college, many educational institutes require courses to be provided by accredited schools. There are many choices with many price ranges. There are several educational institutes that are called "diploma mills." These institutes cost a lot, require very little work or time, and award diplomas, certifications and degrees. Having the piece of paper is great. Having a piece of paper worth less than the printing is another. Courses or programs that are not accredited by a reputable institute, students are truly getting out what they are putting into it, minus the money they probably lost.

Distance learning has been around for many years. The move from distance learning to virtual learning has changed the typical student. In

distance learning, the typical students have been working adults, primarily female. However, with a more mainstream of distance learning as an alternative educational choice and the virtual learning options, the typical student may soon be more equivalent to the traditional student: younger and a full-time student (Roblyer, 1999). Some findings indicate that roll call currently may be a factor in distance learning because more white students have home computers than African American (Hoffman & Novak, 1998). Hoffman and Novak found that among households with incomes under $40,000, 27.5 percent of white households had computers, but only 13.3 percent of black households had computers (Kiernan, 1998). Worldwide, nearly 200 million people have access to the Internet, with 80 million published in Education Week, researchers found that 51 percent of American classrooms reported having Internet connections in 1998, an increase of 27 percent from the previous year. The same study indicated that 49 percent of the nation's schools have high-speed Internet connection to the Web. Furthermore, the rate of Internet-connected computers to students was 1 to 13.6 nationwide in 1999, a marked improvement from 1998 when the average ratio was 1 to 19.7. Ratios vary considerably among the states, with Delaware reporting the best ratio of 1 Web-connected computer to 5.6 students, North Caroline reporting 1 to 25.4, and The District of Columbia the worst ratio of 1 to 31.1 (Barker, 2000).

Data is easier to collect from public and private schools regarding courses, computers/technology, and enrollments. A long-time challenge for data collectors is from students and parents that are home schooled. Home schooling became popular in the early 1980's. The main reason for this is dissatisfaction with local schools, poor teaching and safety concerns. Although there's no official count, the Department of Education estimates that more than half a million students are home schooled, about 1 percent of the total school-age population. This is a 30 percent jump from 1991 (Hawkins,1996). Virtual learning plays an important role in a home-schooled student's education. The traditional homeschooler does not have many of the educational opportunities as those in public or private schools. Students in public and private schools don't always have all the educational opportunities of their neighboring districts. Virtual learning levels the playing field and provides endless opportunities for homeschoolers.

Virtual learning has also become an important component offered at the university level. Young (1998) reports that universities have come under increasing pressure in recent years to cut costs and reform teaching methods, often through collaborative efforts with business and industry. Thus, distance technology has become a way to reduce costs, form partnerships with companies, and inject new life into instruction. The

National Center for Education Statistics found that 90 percent of all educational institutions with enrollments of 10,000 or more students expect to offer distance-learning courses. More than 750,000 students were enrolled in distance education courses in 1994-95. The majority of these students, 55 percent, attended public community colleges. There are currently almost 10,000 college-level courses offered on the Internet (Cagney, 1997). Last year, according to the Chronicle of Higher Education; New York University's School of Continuing and Professional Studies pulled in revenues of $92 million, while the Harvard Extension School, which serves nearly 60,000 part-time students, earned a hefty $150 million (Confessore, 1999). Colorado State University's MBA uses the same faculty and curriculum as the on-line campus programs, so students get the equivalent of a nationally recognized program. Tuition ranges from $12,000 to $14,000. Ohio University offers an MBA for entrepreneurship. The $30,000 fee includes a laptop computer, room and board for the three one-week and three-weekend residency. Rochester Institute of Technology offers Masters of Science degrees in information technology. Tuition ranges from $25,300 to $30,000. Finally, California State University's Humanities External Degree program may not advance your career, but it has been around for a long time and tuition is only about $4,000, in-state or out (Schulhof, 1999).

Schofield (1999) states that the United States is not the only country that offers virtual learning courses and programs. Leaders in on-line education by courses offered: United States 75%; Canada 16%; Australia 5%; United Kingdom 2%; and 2% combined from other countries. With an Internet connection, many on-line courses are available around the world. The subjects that dominate virtual learning by number of courses: Applied Sciences, Technology 4,391; Business, Economics 3,348; Social Sciences 2,618; Arts 2,576; Sciences 1,597; Education 1,007; Health and Medicine 930; Personal Interest, Leisure, and Sports 478; and Vocational Training 368 (Schofield, 1999).

Virtual classes and virtual schools provide many advantages for students young and old, as well as institutions that offer them. Institutions that offer virtual classes provide many new options for their students and creates a new dimension for raising revenues. The real advantages are for students, especially students that have special needs, live in rural areas, are financially challenged, or have problems learning in a traditional classroom. Giving students a choice in how, when, and where they learn is the primary reason for institutions to develop virtual courses. We can help students achieve by providing students flexibility in time. According to the SCANS Report, "In our current system, time is the constant and achievement is the variable. We have it backwards. Achievement should

be the constant and time the variable" (Johnston, 2000). The opportunity to learn is available 24 hours a day, 7 days a week. For many students, there are numerous courses to choose from at a variety of costs.

Students in rural areas are challenged by availability of certain resources. Small schools sometime combine students and classes to provide courses otherwise not possible due to limited teachers, facilities, resources and money. Rural school districts can teach students in satellite locations or even at home. In general, school districts could offer a large variety of subjects and improve the quality of existing courses, while saving in faculty and transportation costs (Gilbert, 1999). Another challenge for students in rural schools is getting hands-on school-to-work opportunities. Always a cornerstone of vocational-technical education, work-based learning has grown more popular as a school-to-work component. But for students in rural towns, work-based opportunities remain scarce (Husain, 1998).

Virtual schools can provide learning for students with special needs. These students can enjoy using Internet resources to create up-to-date, real-life projects that are tailored to their own learning styles (Tuttle, 1998). Learning at home creates many conveniences for students with physical disabilities, students that are homebound or too ill to leave their home. In our sometimes cruel social society, people with disabilities

benefit from the fact that technology is blind, and there are not racial or cultural barriers (Tuttle, 1998). Regardless of the person utilizing technology and virtual learning, the total benefits and advantages of "virtual" has not yet been determined...the best is yet to come.

Can everything about virtual learning, classes, courses, and schools be positive? There is definitely a flip side of the virtual coin. It does have problems and it does have critics. Educators are a naturally conservative bunch. So, it's not surprising that many tend to see virtual learning as a sort of educational alternate reality where classes become "content," universities become "providers," and corporate representatives speak enthusiastically of "branding" (Confessore, 1999).

In loco parentis means that teachers can take the place of parents while children are at school. Who is in loco parentis when it comes to the Internet and technology? The Internet has no central administrative headquarters or governing body. No one monitors or censors information that is coming into the virtual classroom. Not everything on the Internet is positive for education. Any "man-off-the-street," geek Webmaster, talented teacher, cultist, science department faculty, legitimate high school, school district, university extension division, or group of home-schoolers can start a virtual school (Van Horn, 1997).

While there are many benefits to virtual classes, not all students are well suited to them. Students must be good readers, organized, sufficiently self-reliant, have appropriate computer knowledge and skills, and the drive and self-discipline to complete courses. Some families may not be able to afford the virtual school's cost of a computer, modem, Internet provider, and tuition (Tuttle, 1998). Some virtual schools require even more equipment before enrolling.

One of the biggest problems facing virtual learning is the acceptance of course credit at local high schools and universities. Too often, students find out they have been granted virtual credit that will not transfer, after the fact. Research doesn't help the virtual learning movement either. Dropout rates from distance learning courses continue to be a problem. It seems likely that students who have difficulties structuring their time and coping with the demands of schoolwork may drop out more, achieve less, and find their learning experience less enjoyable (Roblyer, 1999).

Where will virtual reality learning be in ten years? What new and different educational applications will be available to students and teachers? I believe virtual learning opportunities will continue to grow, if for no other reason than for a choice. Technology will continue to improve, school reformers will continue to reform, and traditionalists will

continue to dig their heels in to slow down change. As long as there is a market for change and choice in education, virtual learning will continue to be a reality.

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